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Accurately Predicting The Future

(http://vertassets.blob.core.windows.net/image/c40d437a/c40d437a-42e9-4d8c-870c-e426e45b2c28/hto_virtual_health.jpg)

By Barry P. Chaiken, MD, MPH, CMIO, Infor

Joe Maddon, the Cubs manager, is chomping on the end of his water bottle. It is the bottom of the ninth inning and Fenway Park is a screaming madhouse. It is game seven of the 2015 World Series and the Cubbies have a one run lead over the Boston Red Sox. With two men out, the bases are loaded with Brock Holt on third, Mookie Betts on second, and Dustin Pedroia on first. The Cubbies are just one out away from their first championship since 1906.

Big Papi, David Ortiz, steps up to the plate. A base hit wins the game while an out ends a century of misery for the fans on the north side of Chicago. The infield defensive shift is on but how does Maddon know where to position his players?

Every major sports team utilizes predictive analytics to win games. *Wikipedia* (https://en.wikipedia.org/wiki/Predictive_analytics) defines predictive analytics as, "A variety of statistical techniques from modeling, machine learning, and data mining that analyze current and historical facts to make predictions about the future, or otherwise unknown events. In business, predictive models exploit patterns found in historical and transactional data to identify risks and opportunities."

Currently more than 91 percent of hospitals utilize electronic medical records (EMR) thanks to funding from the HITECH act. In addition, more than 75 percent of HITECH act funding-eligible professionals use EMRs. This represents an extremely rich source of data available for predictive analytics work. With the recent digitization of medical equipment and the explosion in the use of "Internet of Things" devices such as Fitbits and smart scales, data scientists possess ever increasing data to apply innovative and newly developed analytical and statistical techniques. Lastly, the decrease in the cost of computing power and data storage allows for many more scientists to "crunch" data looking for nuggets of knowledge.

Golden Nuggets

This explosion in the availability of patient information overwhelms clinicians. Limited in the time they have available for each patient, they struggle deciding what information to review and carving out the time to review it. Then they face the challenge of effectively synthesizing the information and applying it to patient care.

While healthcare information technology bombards clinicians with ever increasing patient data, it generally fails to offer clinicians tools and solutions that help them utilize this data effectively. In addition, clinicians historically rejected digital tools that appeared to "interfere" with decision-making sovereignty.

Fortunately, the expansion in the use of digital tools throughout society is changing the way all clinicians utilize information technology, even ones that infringe upon their decision making authority. The widespread use of healthcare information technology (HIT) clinical decision support (CDS) tools, such as Up-To-Date and Epocrates, illustrate how passionately clinicians embrace tools that assist them in their patient care tasks. Yet, this electronic access to medical information seems like a beta version in utilizing HIT to more effectively treat patients.

Each day national security computers comb through terabytes of data to understand potential threats to our safety, and feed that information to humans who review those potential threats. Without these "crunching machines" humans could not review the huge surveillance data produced each day nor understand the information inherent in it. Only machines are able to distinguish the signal from the noise and identify only those data points that deserve human examination and intervention.

The exponential rise in data acquisition by provider organizations through their EMRs and other connected devices presents a new repository of data points that can be analyzed to predict the future. Although not strictly a 100 percent accurate prediction of a patient's future condition, this data, if processed correctly, can identify the important data points for scrupulous review by clinicians and offer suggestions for further diagnostic or care plans. This HIT cuts through the noise of overwhelming patient data and helps focus the clinician on the information that is most likely important to review.

Some HIT vendors possess the analytics knowledge, computing power, and general technology to ingest patient data and produce valuable patient and population specific knowledge from it. Healthcare providers possess a fundamental understanding of patient care and the clinical knowledge that supports it. If brought together, vendors and their clients can synergistically work together to leverage disparate patient data to understand disease processes and identify diagnostic and therapeutic care plans that deliver superior outcomes. In addition, vendors and providers jointly can figure out how to present that information to clinicians in an effective way that delivers measurable changes in patient care and its related outcomes.

If Joe Maddon can use predictive analytics delivered by his baseball wonks to prevent David Ortiz from prolonging misery on the north side of Chicago, then surely vendors and providers can join forces to use the same technology to deliver to clinicians the knowledge required to deliver the most effective and efficient care to their patients.

About the author

Barry Chaiken is the chief medical information officer of Infor. With more than 20 years of experience in medical research, epidemiology, clinical information technology, and patient safety, Chaiken is board certified in general preventive medicine and public health and is a Fellow, former Board member, and Chair of HIMSS. As founder of DocsNetwork, Ltd., he worked on quality improvement studies, health IT clinical transformation projects, and clinical investigations for the National Institutes of Health, UK National Health Service, and Boston University Medical School. He is currently an adjunct professor of informatics at Boston University's School of Management. Chaiken may be contacted at barry.chaiken@infor.com.

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